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EXAMINER	
LAM, ANN Y	

ART UNIT	PAPER NUMBER
1641	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/068,292	HIROTA ET AL.	
	Examiner	Art Unit	
	Ann Y. Lam	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 June 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7,8,11-32 and 58-64* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7, 8, 11-32, 58-64* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 1-6, 9, 10 and 33-57 have been canceled.

Claims 7, 8, 11-32 and 58-65 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 65 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 65 recites that other one of said solution sample and said solution containing no capture is said solution containing no capture. However, claim 65 depends from claim 7, which recites that the solution samples each contain a capture (see claim 7, lines 4-5), and thus claim 65 is inconsistent with claim 7, and it is not clear whether the sample solution in claim 65 has or does not have capture. Also, the alternative recited in claim 65 is that the solution containing no capture is the solution containing no capture, which does not add anything to the independent claim 7.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 7, 8, 11, 14, 16-19, 21-22, 26-32, 59, 64 and 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brennan, 5,474,796, in view of Sluka et al., 5,851,840.

Brennan discloses the invention substantially as claimed. More specifically, as to claims 7 and 8, Brennan discloses a method for producing a biochip comprising the steps of:

providing a substantially planar based plate (col. 2, line 29, and fig. 3);

supplying onto the upper surface of said base plate, a plurality of solution samples each containing a capture (col. 7, lines 53-55, and fig. 3) used to specifically react with a specimen in order to obtain information on a structure or a function of said specimen (col. 3, lines 11-12);

supplying a solution containing no capture separately from and in the same location as each of said solution samples (col. 7, lines 46-47)

wherein one of said solution sample and said solution is supplied onto the other one of said solution sample and said solution while said other one of said solution sample and said solution is in liquid form (col. 7, lines 46-56). (The Office notes that the solution sample containing capture is disclosed as being in droplets, see column 7, in

53, and thus is in solution form. The solution containing no capture is also in solution form because it is disclosed as having a surface tension, see column 7, lines 46-47.)

While Brennan discloses supplying a solution containing no capture in the same location as each of the solution samples, Brennan does not specifically disclose that the solution containing no capture is supplied in accordance with an ink-jet system. (Brennan discloses using printing to apply oligonucleotides—see column 8, lines 25 and 44-46, which are equivalent to Applicant's solution samples. However, Brennan does not specifically disclose that the silane reagent, e.g., hydroxyalkylsiloxane on page 7, line 51, or aminoalkylsilane on column 2, lines 41-42, are deposited by an ink-jet system. The "chemical reactants" disclosed in column 2, line 13, which are deposited by a piezoelectric pump, i.e., ink-jet system, refer to reactants that are deposited on a binding site, i.e., the site with the silane reagent. Thus, the chemical reactants are not specifically disclosed by Brennan to be depositing the silane reagent.)

(The Office notes that the solution sample containing capture is disclosed as being in droplets, see column 7, in 53, and thus is in solution form. The solution containing no capture is also in solution form because it is disclosed as having a surface tension, see column 7, lines 46-47lines 37-38)

While Brennan discloses supplying a solution containing no capture in the same location as each of the solution samples, Brennan does not specifically disclose that the solution containing no capture is supplied in accordance with an ink-jet system. (Brennan discloses using printing to apply oligonucleotides—see column 8, lines 25 and 44-46, which are equivalent to Applicant's solution samples. However, Brennan does

not specifically disclose that the silane reagent, e.g., hydroxyalkylsiloxane on page 7, line 51, or aminoalkylsilane on column 2, lines 41-42, are deposited by an ink-jet system. The "chemical reactants" disclosed in column 2, line 13, which are deposited by a piezoelectric pump, i.e., ink-jet system, refer to reactants that are deposited on a binding site, i.e., the site with the silane reagent. Thus, the chemical reactants are not specifically disclosed by Brennan to be depositing the silane reagent.)

However, Sluka et al. teach that reaction partners can be applied to respective spots by ink-jet printing (col. 11, lines 13-15) thereby forming a pattern of spots (col. 7, lines 37-38) thus providing an element that enables a concurrent qualitative or quantitative determination of a multitude of analytes in a sample or of one analyte in different samples in a small space and requires only very small amounts of reagent for analytical purposes (col. 8, lines 52-59). Sluka et al. teach that spatially separate application of the reaction solutions can be carried out by conventional methods such as pipetting, stamping or printing techniques such as ink-jet (col. 10, lines 48-51.) It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the Brennan silane reagent, (which is equivalent to Applicant's solution containing no capture) using ink-jet printing as taught by Sluka et al. because Sluka et al. teach that ink-jet printing is a conventional method that provides the benefit of applying reaction partners, such as the Brennan oligonucleotides and the silane reagent, to respective spots forming a pattern of spots as would be desirable for enabling a concurrent qualitative or quantitative determination of analytes in a sample or of one analyte in different samples in a small space.

While Brennan may not disclose that different types of silane reagents may be used on the same substrate, the motivation to do so is found in the Sluka et al. reference, which discloses that different reagents may be applied for concurrent determination of a multitude of analytes. Sluka et al. thus provide the motivation to utilize ink-jet printing to apply the solution disclosed by Brennan in column 5, lines 26-30, as "a second, polar silane which contains either a hydroxyl or amino group suitable for anchoring solid phase oligonucleotide synthesis", because Sluka et al. teach that such printing provides the benefit of applying different reagents, e.g., silane with hydroxyl or amino group, enabling binding of different molecules, as may be desirable to the skilled artisan. Moreover, the skilled artisan would also be suggested by Sluka et al. to utilize ink-jet printing as a conventional method for applying a solution, regardless of whether the material to be applied to different spots are to be same or different because Sluka et al. teach that the ink-jet printing is a conventional method of carrying out *spatially separate* application of reaction solutions (col. 10, lines 48-51), as would be desirable in the spatially separate reaction spots in the Brennan invention. Furthermore, Sluka et al. teach that a solution of the *same or different* reaction partners is applied, for example with a pipette, to the binding matrix spots (col. 10, lines 59-62.) Thus, Sluka et al. teach that pipetting, listed as one of the conventional methods of carrying out spatially separate application of reaction solutions, can be used to apply same or different materials. Such disclosure regarding pipetting would suggest to the skilled artisan that ink-jet printing, also listed as a conventional method of carrying out spatially

separate application of reaction solutions, and which also works by applying a spot of material, may also be used to apply *same or different* materials.

As to the following claims, Brennan disclose the limitations as follows.

As to claim 11, the solution containing no capture (col. 5, lines 26-30 and col. 7, lines 46-56, and fig. 3) is an immobilization solution for immobilizing said captures onto said base plate or an immobilization-reinforcing solution for reinforcing immobilization of said captures onto said base plate.

As to claim 14, the immobilization solution or immobilization-reinforcing solution is supplied onto said base plate, and then said solution sample is supplied to parts to which said immobilization solution or immobilization-reinforcing solution has been supplied (col. 6, lines 8-17 and figure 3.)

As to claim 16, the captures are nucleic acids (col. 5, lines 1-9).

As to claim 17, the nucleic acid is DNA or fragment thereof (col. 5, lines 1-9.)

As to claim 18, the captures are proteins (col. 3, lines 23-25.)

As to claim 19, the protein is antibody (col. 2, lines 22-26.)

As to claims 21, the immobilization solution is a silane coupling agent (col. 5, lines 26-30 and col. 7, lines 46-56.)

As to claim 22, the immobilization solution includes a chemical substance for chemically modifying a base plate surface (col. 7, lines 46-48), and a functional group introduced into said base plate surface, and a functional group introduced by modifying said capture are subjected to a chemical reaction to immobilize said capture onto said base plate by means of covalent bond (col. 7, lines 46-55.)

As to Claims 26-29, since the immobilization-reinforcing solution was recited in the alternative (see claim 11), these claims are anticipated by the disclosure of the immobilization solution (col. 7, lines 46-55.)

As to claim 30, the method further comprises preparing a jig (i.e., "mechanical stage" in col. 8, lines 57-58) to which a plurality of said base plates (3 and 6 in fig. 7) are set, wherein the solution sample and the solution containing no capture are supplied in a state in which said base plates are fixed on said jig.

As to claim 31, an area in which said solution containing no capture is supplied is substantially the same as an area to which said solution sample is supplied, or an area which includes said area to which said solution sample is supplied, said area having a substantially circular shape (col. 7, lines 46-55 and fig. 3.)

As to claim 32, an area, in which said solution containing no capture is supplied onto said base plate, is considered to have a size which includes two or more areas to each of which said solution sample is supplied (col. 7, lines 46-55 and fig. 3).

As to claim 59, the immobilization solution is an alkyl group (col. 7, line 46.)

As to claim 64, Applicants claim that the solution containing no capture is of a common composition used with a plurality of different solution samples. Brennan discloses in column 2, lines 59-62, and column 5, lines 26-39, that a silane with either a hydroxyl or amino group is used. Because Brennan discloses that either type of silane may be used, this thus encompasses the use of the same type of silane in the same substrate. Alternatively, while it is not clear from the disclosure that the same type of silane is used on the same substrate, nevertheless it would have been obvious to one of

ordinary skill in the art at the time the invention was made to provide the same type of silane because Brennan discloses that either of the disclosed types of silane may be used. The disclosure that either type of silanes may be used would suggest the skilled artisan to use the same type of silane on the same substrate as well as give the skilled artisan reasonable expectation of success in immobilizing molecules to the silanes. As to using a plurality of different solution samples, while Brennan does not specifically disclose use of different samples, Sluka et al. teach that different reaction partners may be applied (col. 11, lines 40-43 and lines 59-62), and thus different analytes can be determined (col. 9, lines 7-12) and concurrent qualitative or/and quantitative determination of a multitude of analytes can be made (col. 8, lines 52-57.) As to the use of *ink-jet printing* to apply the *same or different* type of reagents, this has been discussed above regarding claim 7.)

As to claim 65, the solution containing no capture does not contain capture.

2. Claims 23 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brennan, 5,474,796, in view of Sluka et al., 5,851,840, and further in view of Okamoto et al., 6,476,215.

Brennan discloses the invention as claimed (see above). However Brennan does not teach that the chemical reaction is a reaction of amino group and epoxy group

(claim 23), nor that the immobilization solution is a solution containing hydrophobic group (claim 25.) Okamoto et al. teach these limitations.

Okamoto et al. teach that an amino group on a solid support and an epoxy group on a nucleic acid can be used to immobilize the nucleic acid to the solid support (col. 6, lines 60-62.) It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the combination of an amino group and epoxy group as taught by Okamoto et al. in the Brennan invention because Okamoto et al. teach that this combination provides the advantage of immobilizing nucleic acids to a solid support. (With respect to claim 25, the epoxy rings are hydrophobic, see col. 13, lines 24-28 and col. 6, lines 60-62.)

3. Claims 12, 13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brennan, 5,474,796, in view of Sluka et al., 5,851,840, and further in view of Borrelli et al., 6,350,618.

Brennan discloses the invention substantially as claimed (see above), except for the immobilization solution or the immobilization-reinforcing solution being advanced by mixing the immobilization solution or immobilization-reinforcing solution with the solution sample (claim 12), or that the solution sample being supplied onto the base plate and then the immobilization solution or immobilization-reinforcing solution is supplied to parts to which the solution sample has been supplied (claim 13), or that the immobilization solution or immobilization-reinforcing solution and the solution sample

being supplied substantially simultaneously onto said base plate (claim 15). Borrelli et al. disclose this limitation however.

As to claim 12, Borrelli et al. teach that a premixed solution of immobilization solution, i.e., acrylamide monomer solution, is mixed with oligonucleotides and is printed onto substrate functionalized with a silane (col. 11 lines 26-48 and col. 12, lines 6-45.) The acrylamide provides the necessary cross-linking required for DNA or other biomolecule immobilization (col. 11, lines 29-30). Thus the acrylamide is considered to be a solution containing no capture and is an immobilization solution or immobilization-reinforcing solution. It would have been obvious to one of ordinary skill in the art at the time the invention was made to print a mixed solution of an immobilization agent and oligonucleotides onto a solid support as taught by Borrelli et al. in the Brennan invention because Borrelli et al. teach that that such a technique provides the advantage of immobilizing the oligonucleotides to a substrate.

As to claim 15, the immobilization agent and the solution sample are considered to be supplied simultaneously onto a solid support because they are mixed in a solution and then applied onto the solid support.

As to claim 13, because Borelli et al. teach that a premixed solution of immobilization solution (acrylamide) and oligonucleotides to be printed, it would have been obvious to one of ordinary skill in the art at the time the invention was made that either the acrylamide or oligonucleotides can be printed first and one of the other can subsequently be printed on the other, because such printing will result in a solution wherein the acrylamide and oligonucleotides will be intermixed by diffusion. That is, the

skilled artisan would recognize that the oligonucleotides will be cross-linked by the acrylamide even if the acrylamide are printed first, given the teachings by Borelli et al. that the acrylamide and oligonucleotides can be premixed, and thus it would have been obvious to the skilled artisan to print the acrylamide first as this provides an equivalent result.

4. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brennan, 5,474,796, in view of Sluka et al., 5,851,840, and further in view of Hammond et al., 6,255,051.

Brennan discloses the invention substantially as claimed. More specifically, Brennan discloses use of functional groups introduced into the solid support and into the probe to form covalent bonds to more firmly fix the probe to the solid support (col. 7, lines 46-55.) However Brennan does not teach the use of ionic bonds to fix the probe to the solid support.

Hammond et al. teach that, in addition to functional groups providing covalent bonds between nucleic acids and a solid support, ionic interactions can also facilitate immobilization of nucleic acids onto a solid support (col. 18, lines 8-14 and lines 19-20.) Hammond et al. teaches that the binding can be direct as between the nucleic acid and solid support, or indirect such that an intermediate molecule lies between the nucleic acid and the solid support (col. 18, lines 21-23.)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide for ionic bonds between the nucleic acids and the solid

support as taught by Hammond et al. in the Brennan device because Hammond et al. teaches that providing for ionic bonds is an alternative to providing for covalent bonds to immobilize nucleic acids onto a solid support.

5. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brennan, 5,474,796, in view of Sluka et al., 5,851,840, and further in view of Dattagupta, 4,950,588.

Brennan discloses the invention substantially as claimed. More specifically, Brennan discloses use of functional groups introduced into the solid support and into the probe to form covalent bonds to more firmly fix the probe to the solid support (col. 7, lines 46-55.) However Brennan does not teach that the immobilization solution includes avidin.

Dattagupta teaches that, in addition to functional groups providing covalent bonds between nucleic acids and a solid support, the bonding between the nucleic acid and solid support can be through use of avidin as a linker (col. 18, lines 1-12, and col. 19, line 4.)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use avidin as a linker between the nucleic acids and the solid support as taught by Dattagupta in the Brennan device because Dattagupta teaches that use of avidin as a linker is an alternative to providing for covalent bonds between nucleic acids and a solid support.

6. Claim 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brennan, 5,474,796, in view of Sluka et al., 5,851,840, and further in view of Balint, Jr. et al., 4,681,870.

Brennan discloses the invention substantially as claimed. More specifically, Brennan discloses use of functional groups introduced into the solid support and into the probe to form covalent bonds to more firmly fix the probe to the solid support (col. 7, lines 46-55.) However Brennan does not teach that the immobilization solution includes gamma-aminopropyltriethoxysilane. Balint, Jr. et al. however disclose this limitation.

Balint, Jr. et al. teach that gamma-aminopropyltriethoxysilane is used to immobilize proteins to a solid support (col. 3, lines 43-58). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use gamma-aminopropyltriethoxysilane as taught by Balint, Jr. et al. in the Brennan invention because Balint, Jr. et al. teach that gamma-aminopropyltriethoxysilane provides the advantage of immobilizing proteins to a solid support.

7. Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brennan, 5,474,796, in view of Sluka et al., 5,851,840, and further in view of Sakamoto et al., 6,406,898.

Brennan discloses the invention substantially as claimed (see above). Brennan discloses coupling agents to couple antibodies and nucleic acids, to a solid support (see for example, col. 7, lines 46-55). However, Brennan does not specifically list alginic

acid as an example of a coupling agent. Sakamoto et al. disclose this limitation however.

Sakamoto et al. teach that alginic acid is a known immobilization agent (col. 12, line 56 – col. 13, line 5.) It would have been obvious to one of ordinary skill in the art at the time the invention was made to use alginic acid as taught by Sakamoto et al. in the Brennan invention because Sakamoto et al. teach that alginic acid provides the advantage of immobilizing agents.

8. Claim 61 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brennan, 5,474,796, in view of Sluka et al., 5,851,840, and further in view of Schwartz, 5,789,261.

Brennan discloses the invention substantially as claimed (see above with respect to claims 7, 11, 14 and 28). Brennan discloses a coupling agent to couple probes such as antibodies and nucleic acids to a solid support (see for example, col. 7, lines 46-55). However, Brennan does not specifically list polyethyleneimine as an example of a coupling agent. Schwartz discloses this limitation however.

Schwartz teaches that polyethyleneimine is a covalent coupling agent for an immunoreagent, such as an antibody, to be immobilized on a styrene solid substrate, such as a well, (col. 4, lines 7-29, col. 5, lines 46-49, col. 8, lines 56-61, col. 10, lines 15-29) Schwartz teaches that when an antibody is covalently attached to a solid surface, the reproducibility of an assay increases because the antibodies are less at risk of being displaced by fibrinogen (col. 4, lines 7-29).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide polyethyleneimine as taught by Schwartz in the Brennan invention in order to covalently attach antibodies to the surface of the wells because Schwartz teaches that covalent attachment of antibodies to the solid surface provides the advantage of increasing reproducibility of an assay by decreasing the risk of antibody displacement by fibrinogen.

9. Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brennan, 5,474,796, in view of Sluka et al., 5,851,840, and further in view of Wei et al., 6,576,419.

Brennan discloses the invention substantially as claimed (see above with respect to claims 7, 11, 14 and 28). Brennan discloses a coupling agent to couple probes such as antibodies and nucleic acids to a solid support (see for example, col. 7, lines 46-55). However, Brennan does not specifically list polyethylene glycol (PEG) as an example of a coupling agent. Wei et al. discloses this limitation however.

Wei et al. teaches that polyethylene glycol can be used to attach oligonucleotides to a solid surface for assay purposes (col. 7, lines 48-57.) It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide polyethylene glycol as the coupling agent in the Brennan invention because Wei et al. teaches that polyethylene glycol provides the advantage of coupling DNA to a solid support.

10. Claim 63 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brennan, 5,474,796, in view of Sluka et al., 5,851,840, and further in view of Lopez et al., 5,183,735.

Brennan discloses the invention substantially as claimed (see above with respect to claims 7, 11, 14 and 28). Brennan discloses a coupling agent to couple probes such as antibodies and nucleic acids, to a solid support (see for example, col. 7, lines 46-55). However, Brennan does not specifically list BSA (bovine serum albumin) as an example of a coupling agent. Lopez et al. discloses this limitation however.

Lopez et al. teaches using BSA as a coating on a solid support such as microwells to enhance adherence of DNA to polystyrene wells and to eliminate false positives due to the binding of anti-histone antibodies, which provides a consistently high level of reproducibility of assays (col. 4, lines 20-43.)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide BSA as the coupling agent in the Brennan invention because Lopez et al. teaches that such a coupling agent provides the advantage of enhancing adherence of DNA to the wells and eliminating false positives, thereby providing high levels of reproducibility of assays, as would be desirable in the Brennan invention.

Response to Arguments

Applicants' arguments filed June 7, 2007 have been fully considered but are not persuasive.

Applicants argue that neither Sluka nor Brennan disclose that the first solution supplied to the base plate is in liquid form while the second solution is supplied. Applicants state that Brennan discloses in column 6, lines 51-52 and Fig. 3(c) that only a hydroxyalkylsiloxane surface is wet by an acetonitrile such that the two components do not mix as they would if the hydroxyalkylsiloxane surface were in liquid form at the time the acetonitrile is applied. However, Examiner finds that column 6, lines 51-52 only recites ""subjected to acceleration forces. The size of the drop is determined primarily by the surface", and there is no figure 3(c), and the only description of any prevention of mixing is in column 7, lines 56-57, which recites that mixing between adjacent dots is prevented by the hydrophobic barrier of the mask. Applicants arguments are also not persuasive because, as noted in the grounds for rejection, the solution sample containing capture is disclosed as being in droplets, see column 7, in 53, and thus is in solution form. The solution containing no capture is also in liquid form because it is disclosed as having a surface tension, see column 7, lines 46-47. The Sluka reference is relied upon only for its teaching

Applicants also argue that Sluka discloses that if the zones or spots are intended to be the same [contain the same material], the plate can simply be immersed in a reaction solution and ink-jet printing is only used where the zones are intended to be different, and that Brennan and Sluka fail to acknowledge the problems of undesirable and unrelsolved satellite formation solved by the present method of spotting a solution containing a capture and a solution containing no capture in the same location, even if the solution containing no capture is common to all of the solution samples. Applicants

also request that Examiner note that it is possible to stably form spots at correct locations such as is disclosed in the specification on page 22, lines 4-17. Examiner agrees that it is possible to stably form spots at correct locations, and Examiner notes further that this capability is disclosed by both Brennan and Sluka in applying materials to spots on the substrate. Moreover, Applicants' arguments are not persuasive because while Sluka et al. do state that the carrier element can simply be immersed in a reaction solution if the spots of the binding matrix are intended to be the *same*, Sluka et al. *nevertheless teach that ink-jet printing is a conventional method of applying spatially separate* reaction solutions (col. 10, lines 48-51.) The skilled artisan would be suggested to use the conventional method of ink-jet printing to apply a solution *regardless* of whether the material to be applied to different spots are to be same or different because Sluka et al. teach that the ink-jet printing is a conventional method of carrying out *spatially separate* application of reaction solutions (col. 10, lines 48-51), as would be desirable in the spatially separate reaction spots in the Brennan invention.

Furthermore, Sluka et al. teach that a solution of the *same or different* reaction partners is applied, for example with a pipette, to the binding matrix spots (col. 10, lines 59-62.) Thus, Sluka et al. teach that pipetting, listed as one of the conventional methods of carrying out spatially separate application of reaction solutions, can be used to apply same or different materials. Such disclosure regarding pipetting would suggest to the skilled artisan that ink-jet printing, also listed as a conventional method of carrying out spatially separate application of reaction solutions, may also be used to apply *same or different* materials since both pipetting and ink-jet printing apply a spot of material. Sluka

et al. do *not* teach that ink-jet printing should not be used where the same reagents are to be applied, nor that immersion *must* be used where the same reagents are to be applied, but rather that immersion *can* be used where the same reagents are to be applied. If Sluka et al. were interpreted to suggest that ink-jet printing should not or could not be used where the same reagents are to be applied, then it would not make sense that Sluka et al. would also disclose that a conventional method such as pipetting can be used to apply the same or different reagents.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ann Y. Lam whose telephone number is 571-272-0822. The examiner can normally be reached on Mon.-Fri. 10-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 571-272-0823. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ann Y. Lam

Ann Y. Lam
Primary Patent Examiner